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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/990,964 | 11/21/2001 | Andrew Roman Chraplyvy | 28-3-1-7 | 3319 |

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| EXAMINER | |
|---|---|
| LEE, DAVID J | |
| **ART UNIT** | **PAPER NUMBER** |
| 2633 | |

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/990,964 | CHRAPLYVY ET AL. | |
| | Examiner | Art Unit | |
| | David Lee | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2,4-13,15 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-13,15 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 2, 9, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ito (US Patent No. 6,650,846 B1).

Regarding claims 1, 2 and 16, Ito teaches an optical communication system comprising: a transmitter, including: a means for modulating an optical carrier in a sequence of RZ pulses (fig. 14; see Abstract: RZ signals may be used instead NRZ); a modulator for modulating an optical phase of said pulses in accordance with an input digital data stream to form an optical phase modulated signal (fig. 14: RZ data is phase modulated by phase modulator 2); and a means for applying the optical phase modulated signal to a dispersion managed optical transmission link (col. 4, lines 30-40);

a dispersion managed optical transmission medium (col. 4, lines 30-40); and a receiver of the optical phase modulated signal (400 of fig. 4).

Regarding claim 9, Ito teaches that the transmitter includes a wavelength division multiplexer adapted to combine an output signal of the modulator with other optical phase modulated signals having optical carriers with different wavelengths (col. 4, lines 43-46).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Price et al. (US Patent No. 6,522,439 B2).

Regarding claim 4, Ito teaches the limitations of claim 2 but does not specifically disclose that the modulator is a PSK modulator. However, PSK modulation is a modulation scheme well known in the art of data encoding and is one of a plurality of modulation formats available to an artisan. For example, Price teaches an optical transmitter utilizing a PSK modulator (col. 2, lines 14-16). One of ordinary skill in the art would have been motivated to use a PSK modulation scheme in order to achieve a healthier transmission quality. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use PSK modulation in the system of Ito.

Regarding claim 5, Ito teaches the limitations of claim 2 but does not specifically disclose that the modulator is a DPSK modulator. However, DPSK modulation is well known in the art and is one of a plurality of modulation formats available to an artisan. For example, Price teaches an optical transmitter utilizing DPSK modulation (col. 8, lines 50-57). One of ordinary skill in the art would have been motivated to use a DPSK modulation scheme in order to achieve a healthier transmission quality. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use DPSK modulation in the system of Ito.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Tzukerman et al. (US Patent No. 6,724,829).

Regarding claim 6, Ito teaches the limitations of claim 2 but does not expressly disclose that the modulator is a QPSK modulator. However, QPSK modulation is a modulation scheme well known in the art of data encoding and is one of a plurality of modulation formats available to an artisan. For example, Tzukerman discloses a QPSK modulator (314 of fig. 3, and col. 4, lines 56-57). It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate a QPSK modulator in the system of Ito because QPSK modulation has the advantages of high spectral efficiency and low bit error rate (col. 4, lines 56-61). Also, both the in-phase and the quadature portions of the carrier signal can be modulated and combined to form the QPSK signal.

7. Claims 7, 8, 10, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Suzuki et al. (US Patent No. 6,005,702).

Regarding claim 7, Ito teaches the limitations of claim 1 but does not expressly disclose that the long haul transmission medium adapted for transmitting solitons. However, transmitting solitons in long haul transmission mediums is well known in the art. For example, Suzuki teaches of transmitting solitons through a long haul transmission medium (col. 1, lines 23-30). One of ordinary skill in the art would have been motivated to use solitons over a soliton transmission medium because solitons present advantages of lower energy loss, longer transmission capabilities and larger effective signal bandwidth. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have the long haul transmission medium adapted for transmitting solitons.

Regarding claim 8, Suzuki teaches that the medium is adapted for transmitting pulses that disperse as they propagate along the medium (solitons disperse during propagation; see also col. 4, lines 19-27).

Regarding claim 10, Ito teaches the limitations of claim 2, but does not expressly disclose that the modulator is a LiNbO3 modulator. However, LiNbO3 modulators are well known in the art. For example, Suzuki teaches a LiNbO3 phase modulator (col. 3, lines 64-65). It would have been obvious to one of ordinary skill in the art at the time of invention to use a LiNbO3 modulator in order to have an effective and reliable modulation scheme.

Regarding claim 15, Ito teaches the limitations of claim 15 including the limitation of a fiber optical amplifying means (col. 1, line 41). Ito does not expressly disclose that the amplifying means is an EDFA. However, EDFAs are well known in the art. For example, Suzuki teaches an EDFA for signal amplification (col. 4, lines 31-35). It would have been obvious to one of ordinary skill in the art at the time of invention to use an EDFA for amplification in order to achieve a healthy and accurate signal.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Fukuchi et al. (US Patent No. 5,745,613).

Regarding claim 11, Ito teaches the limitations of claim 2, but does not expressly disclose that the modulator is a LiNbO3 MZ phase modulator. However, LiNbO3 MZ phase modulators are well known in the art. For example, Fukuchi discloses a LiNbO3 Mach-Zehnder phase modulator (col. 6, lines 31-34). It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the LiNbO3 Mach-Zehnder modulator in the system of Ito because Mach-Zehnder modulators have the advantage that the chirp may be adjusted to the bit rate and the transmission distance (col. 6, lines 34-36).

9. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Smith (US Patent No. 4,847,477).

Regarding claims 12 and 13, Ito teaches the limitations of claim 1 but does not expressly disclose that the receiver includes a delay demodulator or a balanced

receiver for recovering said input data from said phase modulated signal. Smith teaches a delay demodulator (fig. 3 – 18, and col. 4, line 21) and a balanced receiver for recovering said input data from said phase modulated signal (fig. 3 – 15, 25, and 22). One of ordinary skill in the art would have motivated to include these components of Smith in the receiver of Ito because balanced receivers eliminate relative intensity noise, canceling the intensity components of a laser, and delay demodulators delay signals so as to evaluate and combine the output signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include a balanced receiver and/or a delay modulator in the receiver Ito.

***Response to Arguments***

10. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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